REMARKS

Claims 24-26, 36, 41 and 42 are pending. Applicants respectfully request reconsideration of the present application in view of the reasons that follow.

Claims 24-26, 36, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over White, US Patent No. 5,893,054 (henceforth "White") in view of Garcia, US patent No. 5,412,985 (henceforth "Garcia"), and further in view of Applicants disclosure page 12, lines 9-17. Applicants traverse.

The White reference is directed toward providing an automated gain control in digital signal processing related to a quartz angular-rate sensor or solid-state gyroscope. (See col. 1, lines 9-12.) As described in the summary at column 2, beginning at line 32, the objective of White is to provide an automatic gain control for a sparsely-sampled sinusoid.

At column 6, beginning at line 13, White notes that his patent "concerns signal processing for the quartz angular-rate sensor 61, 62 and 63." White differentiates quartz angular-rate sensors 61, 62, and 63 from vibrating quartz accelerometers 64, 65, and 66, noting that they operate "**entirely independently**" from the rate sensors. White continues, noting that "the vibrating quartz accelerometers 64, 65, 66 are not pertinent to the present invention and will not be described in any further detail." See col. 6, lines 13-19.

Therefore, as acknowledged in the Office Action (page 3): "White does not explicitly teach a that the sensor is vibratory accelerometer [sic]." Thus, Applicants submit that White is insufficient to sustain a rejection of the pending claims reciting a vibratory accelerometer.

Furthermore, Applicants submit that the Office Action's assertion (page 3) that "it would have been obvious to one skill in the art to modify White in the manner suggested by Garcia by using a vibratory sensor to generate the sinusoidal and a phase computation device to compute

the phase of the digital signal based on $\theta=ARCTAN\ (Q/I)^{-1}$ [sic[1]]in order to provide proper indication of direction of a vibrating signal so as to adjust system parameter so as to counteract the effect of such vibration," is not supported by White, Garcia, or the cited portion of Applicants' disclosure.

As in the prior Office Action, the Examiner appears to be attempting to combine two references which one of ordinary skill in art would not have been motivated to, or otherwise found obvious to, combine. As noted above, White explicitly teaches the use of vibrating accelerometers which operates "**entirely independently**" from angular rate sensors, and describes processing the signals from the rate sensors independent of any other signals. To the contrary, Garcia teaches:

> "A digital ratiometric tracking filter provides superior measurement of the magnitude and phase of vibration of a rotating body, at uniform or non-uniform rotational speed. The sensed speed and vibration signals are **concurrently processed and subsequently combined** to produce the absolute magnitude and relative phase measurements. The **concurrent processing** of the sensed signals assures that any system-introduced errors are found in both signals and can be uniformly eliminated by the ratiometric processing thereof." (Garcia, Abstract, emphasis added).

Thus, in direct contradiction of the explicit teachings of White, Garcia requires concurrent (not independent) processing of two signals--one from a vibration sensor and one from a rate sensor. Without concurrent processing, the system of Garcia would not eliminate system introduced errors (see, e.g., Garcia, col. 3, lines 29-38), and thus would fail at its intended purpose of providing accurate magnitude and phase measurements (Garcia, col. 2, lines 55-59). In light of this, one skilled in the art would have recognized the systems of White and Garcia as incompatible. Accordingly, the proposed combination of White and Garcia has no proper basis.

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[1] Note, Applicants claims actually require computing "computes the instantaneous phase (φ) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $\varphi = \tan^{-1}(Q/I)$."

Further, even if the proposed combination were proper, it would fail to teach or suggest each and every limitation of Applicants' claims. The Office Action (pages 2-3) notes that White "fails to teach that the phase computation device which receives said I (in phase) and Q (phase-shifted quadrature) components and computes the instantaneous phase of said digital signal according to θ=ARCTAN $(Q/I)^{-1}$ [sic]". The Office Action (page 3) goes on to assert that:

> "Garcia teaches a system using a vibratory accelerometer see col. 3, lines 40-45 configured to generate a sinusoidal signal and to measure the phase and amplitude of a digital signal using a phase computation device and an amplitude computation devices, respectively, see col. 5, lines 27-29 and lines 55-56. Given that fact, it would have been obvious to one skill in the art to modify White in the manner suggested by Garcia by using a vibratory sensor to generate the sinusoidal and a phase computation device to compute the phase of the digital signal based on θ=ARCTAN $(Q/I)^{-1}$ [sic]."

However, Applicants are unable to find any teaching or suggestion in Garcia to calculate the instantaneous phase of a signal measured by a vibratory accelerometer by computing the inverse tangent of the ratio of a phase shifted quadrature component of said signal to an in phase component of said signal, as required by Applicants' claims. To the contrary, Garcia only teaches computing the relative phase between two signals, one from a vibration sensor and one from a speed sensor. For example, Garcia teaches:

> "Complex math allows the relative phase angle [between a signal from a vibration sensor and the signal from a speed sensor] to be calculated by multiplying the vibration complex number by the complex conjugate of the speed complex number (i.e. complement of the imaginary component) and then performing the arc tangent of the imaginary component divided by the real component of the resulting complex number." (Garcia, col. 6, lines 27-34)

This is clearly not the same as computing the phase of a single signal from a vibratory accelerometer as the inverse tangent of a ratio of in-phase and phase-shifted quadrature components of that signal. Further, even if Garcia suggests, e.g. in some intermediate step, calculating a phase of a vibration sensor, it teaches doing so by employing a Fast Fourier Transform (Garcia, col. 6, lines 21-24). At no point does Garcia teach or suggest employing the relation $\varphi = \tan^{-1}(Q/I)$.

Accordingly, White and Garcia fail to disclose, teach, or suggest each and every element of the rejected claims. Applicants can find no teaching in the cited portion of Applicants' disclosure which cures the above deficiency. Accordingly, even in the proposed combination of references where proper, there is still no proper basis for the obviousness rejection.

In view of the above, Applicants request reconsideration and withdrawal of the rejection of claims 24-26, 36, 41 and 42 under 35 U.S.C. 103(a)

Conclusion

Applicant believes that there is no longer proper basis for the rejection under 35 USC §103, and that present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 3/18/08

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